WHAT IS CLAIMED IS:

1. An infrared imaging apparatus, comprising:

a dewar, having an internal volume that defines a cold space;

an IR transmissive window that seals the cold space to receive IR energy directly from an IR source;

a first lens located within the cold space to receive IR energy directly from the IR transmissive window;

an IR detector located within the cold space in operational communication with the first lens and positioned coincident to the focal plane of at least a first and second wavelength of IR energy; and

an optical stop located within the cold space in front of the single lens.

2. The infrared imaging apparatus of claim 1, wherein the single lens has a first aspheric profile on a first side and a second aspheric profile on a second side, the first side parallel to the second side and the second side facing the detector.

3. The infrared imaging apparatus of claim 2, wherein the second aspheric profile has a holographic optical element.

4. The infrared imaging apparatus of claim 3, wherein the holographic optical element color corrects at least one color band of infrared energy.

5. The infrared imaging apparatus of claim 4, wherein the holographic optical element color corrects a red MWIR band and a blue MWIR band.

6. The infrared imaging apparatus of claim 1, wherein the detector is a hyperspectral detector.

7. The infrared imaging apparatus of claim 1, wherein the detector detects at least three wavelengths of IR energy including at least one LWIR band of energy.

8. The infrared imaging apparatus of claim 1, wherein the LWIR band of energy is preferably an indigo LWIR band.

9. The infrared imaging apparatus of claim 1, wherein the holographic optical element coincidently focuses a MWIR band and a LWIR band of IR energy at a common focal plane.

10. The infrared imaging apparatus of claim 1, wherein the second wavelength of IR energy is a harmonic component of the first wavelength.

11. The infrared imaging apparatus of claim 1, wherein the single lens is made of germanium.

12. The infrared imaging apparatus of claim 1, wherein the single lens is made of silicon.

13. The infrared imaging apparatus of claim 1, wherein the apparatus performs at an F-stop (F/#) of at least 1.4 with a square field of view of 90x90 degrees.

15. The infrared imaging apparatus of claim 1, wherein the detector concurrently collects radiation from multiple, adjacent spectral radiation bands.

16. The infrared imaging apparatus of claim 3, wherein the first aspheric surface has the following prescription:

radius = -0.94467;
k = 28.345216;
a = -2.13952;
b = -69.5274;
c = 2342.04;
d = -56841.9; and
first surface thickness = 0.548467.

17. The infrared imaging apparatus of claim 16, wherein the second aspheric surface has the following prescription:

radius = -0.61281;
k = 0.1399;
a = 0.033459;
b = -2.3598;
c = 10.889;
d = -36.331; and
second surface thickness = 0.462731.

18. The infrared imaging apparatus of claim 17, wherein the holographic optical element has the following prescription:

-0.0051393, -0.10212, 0.91035, -2.3946.

19. The infrared imaging apparatus of claim 3, wherein the first aspheric surface has the following prescription:

radius = -1.23508;

k = 36.049455;

a = -1.69104;

b = -98.6413;

c = 5589.83;

d = -162359; and

first surface thickness = 0.761661.

20. The infrared imaging apparatus of claim 19, wherein the second aspheric surface has the following prescription:

radius = -0.81270;

k = -0.10748;

a = 0.054475;

b = -0.72423;

c = 2.9155;

d = -7.8939; and

second surface thickness = 0.480234.

21. The infrared imaging apparatus of claim 20, wherein the holographic optical element has the following prescription:

-0.017112, -0.038991, 0.55069, -1.6405.